

Agriculture Outlook Forum 2001

Presented: Friday, February 23, 2001

## COMPREHENSIVE NUTRIENT MANAGEMENT PLANS: POLICY AND PROSPECTS

Thomas W. Christensen  
Director, Animal Husbandry and Clean Water Programs Division  
U.S. Department of Agriculture

### **INTRODUCTION**

Improving our soil and cleaning our surface and ground water resources through voluntary action has been a long standing and successful public/private partnership effort since the establishment of the USDA Soil Conservation Service (SCS) in 1935, and initiation of the public sharing of the costs of on-farm conservation with passage of the Soil Conservation and Domestic Allotment Act in 1936, and the Land Utilization Program in 1937. A basic tenant of NRCS, as expressed in 1945 to a congressional committee by Hugh Hammond Bennett (first SCS Chief), was and still is: "The only way in which water pollution due to erosion silt can be effectively controlled is by the adoption of soil and water conservation practices applied in accordance with the needs and capabilities of the land."

As continued research and field experience during the past half century have led to greater knowledge about what happens to water – how it travels on the surface and below ground, what it carries with it, and how its composition changes as it moves – water quality has emerged as a top priority for NRCS conservation efforts. Over the years, NRCS and its cooperating scientists have worked diligently to find the best conservation solutions and bring them to those who farm the land and manage the resources.

While much has been accomplished by farmers and ranchers in addressing nonpoint source pollution from agricultural lands and woodlands, there is still more that must be done. But why is there still more that must be done, despite the past and present conservation efforts of agriculture? Because conditions change - - working with livestock, poultry, natural resources, and agricultural economics by definition means that things will be ever changing - - and correspondingly that agricultural management and conservation practices must be ever evolving to respond to this change. Working with the land, livestock, and poultry means making changes to respond to the changes of nature, the changes in economic conditions, and the changes in knowledge and technology.

To accomplish the necessary next steps in cleaning our Nation's waters, farmers, ranchers, and forest landowners, as well as urban and suburban residents, will need to make an even greater and more focused effort to control nonpoint sources of pollution. Helping private landowners to reduce the sediment and nutrients, along with other pollutants, that may originate on working agricultural lands and woodlands is a primary goal of NRCS.

## **SIGNIFICANCE OF ANIMAL AGRICULTURE**

NRCS recognizes the important economic, environmental, and social issues centered on animal agriculture in the United States, and in other countries, too. The beef, dairy, pork, and poultry industries face significant challenges and we must all work together to achieve viable solutions that make both environmental and economic sense.

Livestock and poultry production generated \$93 billion in revenues in 1996 (USDA-NASS, 1997), making it an important part of both our Nation's economy and its food supply. America's food supply is the envy of the world. But our Nation's farmers and ranchers produce far more than traditional commodities. Well managed agricultural operations also produce healthy soil, clean air and water, wildlife habitat, and pleasing landscapes, all of which are increasingly valued by rural and urban citizens alike.

## **ENVIRONMENTAL IMPACTS OF ANIMAL AGRICULTURE**

However, along with the many benefits that animal agriculture provides, it also produces huge amounts of by-products, such as manure, litter, and waste water. Animal agriculture impacts a significant amount of land in many watersheds because animal manures are applied in solid, semisolid, and liquid forms, as a source of nutrients for crop production. Animal agriculture has garnered much notoriety because of problems associated with improper facilities management and land application of manures at excessive rates. Public criticism has been triggered by outbreaks like *Pfiesteria* in the Chesapeake Bay area, *hypoxia* in the Gulf of Mexico, large lagoon spills, and offensive odors from some animal feeding operations.

Two issues of particular concern to NRCS include pollution of waters from improperly managed animal feeding operations, and the inadequacy of traditional land-based manure nutrient management strategies in some geographic areas as livestock and poultry operations surpass the capacity of the land to assimilate manure nutrients.

## **NRCS' VOLUNTARY, LOCALLY LED APPROACH**

NRCS is working with other Federal agencies, tribal, State, and local public entities, along with the private sector, to help the owners and operators of animal feeding operations (AFO) to voluntarily address the environmental challenges they face. We are supporting the science-based, site-specific solutions that work well for the unique needs of the livestock and poultry sector, and recognize the financial constraints that animal producers face.

NRCS is a strong proponent of the voluntary, incentive-based approach as the principal means to help agricultural producers reduce the environmental impacts of agricultural production. We recognize, however, that regulations administered by regulatory agencies play an important role for the very large, high risk, confined animal feeding operations and for some other very specific situations.

NRCS' conservation programs work in partnership with locally led processes and other local, State, tribal, Federal, and private entities to deliver support for individual, group, and community efforts through research and technology transfer, information, education, technical and financial assistance, and innovative pilot and policy approaches. For example, NRCS' Conservation Technical Assistance and Environmental Quality Incentives Programs are two principal vehicles used by the agency to assist animal feeding operations in meeting environmental objectives in a voluntary manner, while maintaining production. It is also important to note that NRCS' conservation programs are used by many agricultural producers as the technical and financial assistance tools to help them comply with local, State, tribal, and Federal regulations.

## **COMPREHENSIVE NUTRIENT MANAGEMENT PLANNING TECHNICAL GUIDANCE**

Specially toward achieving the goal of helping animal feeding operation owners and operators to manage their operations in a profitable and environmentally sound manner, NRCS in recent years has identified the environmental needs of animal feeding operations as a top conservation priority - - by focusing the energy and identifying the resources needed to carry out:

- ❑ Effective information and education of AFO owners and operators,
- ❑ Research and technology transfer,
- ❑ Direct technical assistance, and
- ❑ Financial assistance.

Toward achieving the objective of getting the needed technical guidance in place to help public and private technical specialists assist AFO owners and operators with their development of CNMPs, NRCS released in December 2000 the Technical Guidance for Developing Comprehensive Nutrient Management Plans. This Technical Guidance was developed over the past year and included receiving constructive public input on the draft guidance through a 120-day public comment period.

The Technical Guidance provides a framework for helping animal feeding operation owners and operators to develop their site-specific, technically sound CNMPs. NRCS' technical handbooks, policies, processes, and planning procedures will provide the up-to-date technical references to help fill in the framework.

A CNMP is a subset of a conservation plan that is unique to animal feeding operations. It is a grouping of conservation practices and management activities which, when combined into a system, will help to ensure that both agricultural production and natural resource conservation goals are achieved. The development of a CNMP needs to address the following six elements:

1. **Manure and Wastewater Handling and Storage** – This element addresses the components and activities associated with the production facility, feedlot, manure and wastewater storage

and treatment structures and areas, and any areas or mechanisms used to facilitate transfer of manure and wastewater.

2. **Land Treatment Practices** – This element addresses evaluation and implementation of appropriate conservation practices on sites proposed for land application of manure and wastewater from an AFO.
3. **Nutrient Management** – This element addresses the requirements for land application of all nutrients and organic by-products (e.g., animal manure, wastewater, commercial fertilizers, crop residues, legume credits, irrigation water, etc.) that must be evaluated and documented for each Conservation Management Unit (CMU).
4. **Record Keeping** – It is important that good records are kept to effectively document and demonstrate implementation activities associated with CNMPs. This element lists documentation requirements associated with developing and implementing a CNMP.
5. **Feed Management** – Feed management activities may be used to reduce the nutrient content of manure, resulting in less land being required to utilize the nutrient contents of the manure. This element addresses feed management activities as a possible opportunity for the AFO owner/operator in the CNMP development process.
6. **Other Utilization Activities** – This element addresses other environmentally-sound utilization options associated with animal manure and wastewater as alternatives to traditional operational and land application methods.

NRCS recognizes that the present CNMP Technical Guidance does not establish criteria to specifically address resource concerns other than the nutrient and sediment aspects of water quality. Many issues related to air quality, odors, pests, pathogens, pharmaceuticals, and heavy metals are not fully understood. We need to develop more agency conservation practice technical standards to more adequately address these issues or problems. It is envisioned that the CNMP Technical Guidance document will evolve over time to address all environmental and public health concerns associated with manure and by-products from animal feeding operations. However, most of the actions undertaken through the implementation of CNMPs under the current Technical Guidance should benefit all natural resource concerns - - soil, water, air, plants, animals, and humans.

Given the magnitude and complexity of the CNMP workload, there is no question that the public and private sectors will need to collaborate closely, using the NRCS' CNMP Technical Guidance and supporting technical references and tools, if we are to succeed in meeting the needs of AFO owners and operators.

In an effort to build additional technical assistance capacity for comprehensive nutrient management planning assistance in the private sector, NRCS is establishing a process for recognizing “approved sources” of conservation assistance. An individual who is appropriately certified through an NRCS recognized approved source is referred to as a “certified specialist”. This may include private consultants, employees of agribusiness, and others who hold appropriate certifications through an approved independent certification organization or state licensing agency.

## **THE NEED FOR A GREATER MIX OR POLICY TOOLS, INCENTIVES, AND PARTNERSHIPS**

The environmental and economic challenges faced by family operated animal feeding operation (AFOs) also calls out for a greater mix of policy instruments, innovative approaches, and alternative incentives. Some broad areas for consideration could include:

- ❑ **Economically Profitable Conservation Technologies** – On-farm conservation technologies should be both good for the environment and good for business. More research and technology transfer are needed to develop and share with both field staff and AFO owners/operators practical conservation technologies that yield short- and long-term economic benefits.
- ❑ **Public/Private Collaboration to Enhance Technical Assistance Capacity** – More and stronger public/private collaboration to supply AFO owners and operators with essential technical assistance for conservation technology adoption is needed. Depending on the need(s), this collaboration can take many different forms, but the key is to capitalize on the strengths of both the public and private sectors to achieve more effective and efficient technical assistance delivery.
- ❑ **Improved Economic Training and Tools for Field Staff** – Both public and private sector technical field staff need a better understanding and more intense training in the economics of conservation technologies, and how to apply it in the comprehensive nutrient management planning process. Along with this enhanced knowledge, field staff need user-friendly tools, including software, to more readily apply this knowledge.
- ❑ **Policies to Stimulate Conservation Technology Innovation** – The pressures of potential and real increasing regulation for AFO owners and operators may present an impetus for stimulating conservation technology innovation. While technological innovation is occurring in agriculture (crop residue management techniques, biotechnology, bioenergy, and precision farming), the opportunity for more and greater conservation technology advances in the animal residuals management arena seems realistic when one looks at the advances in medicine, information technology, communications, automation, and other areas.
- ❑ **New Risk Management Tools** – Some AFO owners and operators resist the adoption of new conservation technologies because they fear it may hurt their income. To address this risk, the private sector could make available more insurance policies that will increase an AFO owners' or operators' willingness to adopt conservation technologies, such as nutrient management, feed management, odor controls, or methane recovery technologies.
- ❑ **Expanded and Enhanced Partnerships** – A greater partnership effort between local, State, tribal and Federal agencies, farmers/ranchers, researchers, educators, private sector enterprises, interest groups, and communities is needed. Voluntary programs intended to help AFO owners and operators deploy on-farm conservation technologies while maintaining viable operations, are most successful when supported by strong partnerships.

- ❑ **Targeting Incentives** – Targeting incentives from local, State, tribal, Federal, and private sources in a more coordinated manner on vulnerable farming operations and/or at a geographic scale offers an opportunity to enhance the effectiveness of the limited incentives available. This may be especially true for certain types of farming operations, such as animal feeding operations, that tend to be more and more concentrated in certain geographic areas and if not properly managed can have significant environmental impacts.
- ❑ **Alternative Uses for Animal Residuals** – Alternative uses for animal residuals are needed in areas where supply exceeds available land, and land application would cause significant environmental risk. USDA and others in the research community must continue to actively pursue research that results in practical, cost-effective application of alternative uses for animal residuals such as: energy production; composting and pelletizing; mixing or blending with industrial or municipal by-products to produce value-added materials for specialized uses; and, using residuals as animal feed. This could help some localities better meet their energy and environmental needs if we had greater investments in alternative uses of animal residuals.

### **NRCS' ACTIONS TO HELP LIVESTOCK AND POULTRY PRODUCERS**

In summary, NRCS' is focusing significant resources and energy to help livestock and poultry producers voluntarily balance production with environmental quality. More specifically, NRCS is:

- ❑ Working to ensure that flexible innovative, and credible technical tools and approaches are being prepared for CNMP development and implementation.
- ❑ Working to ensure that the knowledge, skills, and support are in place for NRCS and partner field staff to provide quality technical assistance.
- ❑ Working to enhance the financial tools available to assist with CNMP implementation.
- ❑ Working with the private sector to ensure that third-party vendors have access to training, technical information and tools, and certification processes.
- ❑ Developing a more integrated approach with partner USDA agencies for addressing AFO needs, especially with USDA's principal research agencies - - the Agricultural Research Service, the Cooperative State Research, Education and Extension Service, and the Economic Research Service.
- ❑ Working to build an outcome reporting capacity in order to quantify the economic, environmental, and other major benefits and effects from CNMP implementation.

The bottom line is that NRCS is using every tool available to us - - from research results to technical and financial assistance to education incentives - - to help livestock and poultry producers voluntarily meet environmental quality objectives.

## **FUTURE NRCS COMMITMENT TO WATER QUALITY**

As we enter the 21<sup>st</sup> Century, I feel confident NRCS' legacy commitment to helping landowners and communities to voluntarily achieve water quality objectives will continue to be strong. Long-term strategies to help landowners and communities protect the quality of our Nation's waters will continue to be expressed by USDA's National Conservation Program, now being updated. Likely long-term strategies for USDA will include:

- ❑ Respecting and supporting States calling the shots when it comes to defining water uses, establishing water quality standards, and establishing priorities for action.
- ❑ Continuing to emphasize voluntary action by landowners and land users.
- ❑ Giving strong emphasis to water quality resource conservation needs in our technical assistance programs.
- ❑ Supporting research that helps landowners and landusers minimize the impact of their activities on water quality.
- ❑ Training employees to make sure that equipped to identify and help landowners and landusers solve water quality problems
- ❑ Providing financial and other incentives to farmers and ranchers for practicing good stewardship.

## **CONSERVATION SUCCESS THROUGH PARTNERSHIPS**

In closing, NRCS conservation assistance is provided through local conservation districts and in partnership with State and tribal conservation agencies, an approach that has proven successful for nearly 70 years. At NRCS, we rely heavily on this nationwide network of State, tribal, and local partners to get cost-effective, science-based conservation on the ground.

Beyond the government conservation partnership, however, we also need more private sector initiatives and public/private partnerships, such as the On-Farm Environmental/Odor Assessment Review Project sponsored by America's Clean Water Foundation. Without question, animal agriculture industry-led initiatives, for example, can significantly increase the voluntary adoption of CNMPs to protect water quality.

The environmental and economic challenges faced by today's AFO owners and operators are complex and too significant for us to do anything less than commit to strong public/private partnerships that benefit our natural resources, the private landowner, and the American public.

# Comprehensive Nutrient Management Plans: Policy and Prospects

**Thomas W. Christensen**

Director, Animal Husbandry and Clean Water  
Programs Division

USDA-Natural Resources Conservation Service



# Public/Private Conservation Partnership

- Voluntary action supported by USDA Soil Conservation Service since 1935
- Public sharing of costs of on-farm conservation
  - Soil Conservation and Domestic Allotment Act in 1936
  - Land Utilization Program in 1937

# First Chief of SCS

- Hugh Hammond Bennett - “The only way in which water pollution due to erosion silt can be effectively controlled is by the adoption of soil and water conservation practices applied in accordance with the needs and capabilities of the land.” (1945 - before a Congressional committee)

# Significance of Animal Agriculture

- Livestock and poultry production generated \$93 billion in revenues in 1996
  - Critical to food supply and economy
- Agriculture, with sound conservation, also produces
  - Healthy soil
  - Clean air and water
  - Wildlife habitat
  - Aesthetically pleasing landscapes

# Environmental Impacts

- *Pfiesteria* in the Chesapeake Bay
- *Hypoxia* in the Gulf of Mexico
- Large Lagoon Spills (12 States)
- Offensive Odors

# Issues of Concern for NRCS

- Pollution of water from improperly managed animal feeding operations
- Land-based manure nutrient management strategies that are inadequate
  - Manure nutrients produced surpass the capacity of the land to assimilate them, in some locations

# Voluntary, Locally Led Approach

- NRCS supports an approach that is:
  - Science based
  - Site specific
  - Voluntary
  - Incentive based
  - Locally led
  - Recognizes financial constraints of producers
- Regulations important for very large, high risk CAFOs and some other very specific situations

# NRCS' Conservation Programs

- NRCS' Conservation Programs offer:
  - research and technology transfer
  - information
  - education
  - technical and financial assistance
  - innovative pilot and policy approaches

*Also used by many producers as tools to help them comply with regulations*

# Comprehensive Nutrient Management Planning Technical Guidance

- Developed during 1999 and 2000, and included receiving public input during 120-day comment period
- Provides technical guidance to help public and private technical specialists assist AFO owners and operators with their development of CNMPs



# Comprehensive Nutrient Management Planning Technical Guidance

- Objective: help AFO owners and operators achieve both agricultural production and natural resource conservation goals

# Comprehensive Nutrient Management Plans - CNMPs

- Subset of conservation plan - unique to AFOs
- Continuation of management and conservation practices
- Site specific
- Voluntary
- Focus is nutrient and sediment aspects of water quality (RMS level quality criteria for soil and water)

# Comprehensive Nutrient Management Plans - CNMPs

- Manure and Wastewater Handling and Storage
- Land Treatment Practices
- Nutrient Management
- Record Keeping
- Feed Management
- Other Utilization Activities

# Comprehensive Nutrient Management Plans - CNMP

- CNMP Technical Guidance does not establish criteria to specifically address:
  - Air Quality
  - Odors
  - Pests
  - Pathogens
  - Pharmaceuticals
  - Heavy metals
- Expect CNMP Technical Guidance to evolve over time to better address these concerns

# CNMP Workload - Complex and Large

- Public and private sectors need to collaborate
- State Conservationist will establish and implement a process for:
  - Certified Conservation Planners
  - Certified Specialists
    - Manure and Wastewater Handling and Storage
    - Land Treatment Practices
    - Nutrient Management

# Need for a Greater Mix of Policy Tools, Incentives, and Partnerships

- Economically Profitable Conservation Technologies
- Public/Private Collaboration to Enhance Technical Assistance Capacity
- Improved Economic Training and Tools for Field Staff
- Policies to Stimulate Conservation Technology Innovation

# Need for a Greater Mix of Policy Tools, Incentives, and Partnerships

- New Risk Management Tools
- Expanded and Enhanced Partnerships
- Targeting Incentives
- Alternative Uses for Animal Residuals

# NRCS' Actions to Help Livestock and Poultry Producers

- Working to ensure that flexible innovative, and credible technical tools and approaches are being prepared for CNMP development and implementation
- Working to ensure that the knowledge, skills, and support are in place for NRCS and partner field staff to provide quality technical assistance



# NRCS' Actions to Help Livestock and Poultry Producers

- Working to enhance the financial tools available to assist with CNMP implementation
- Working with the private sector to ensure that third-party vendors have access to training, technical information and tools, and certification processes

# NRCS' Actions to Help Livestock and Poultry Producers

- Developing a more integrated approach with partner USDA agencies for addressing AFO needs, especially with USDA's principal research agencies
- Working to build an outcome reporting capacity in order to quantify the economic, environmental, and other major benefits and effects from CNMP implementation

## NRCS' Commitment to Water Quality

- Respecting and supporting States calling the shots when it comes to defining water uses, establishing water quality standards, and establishing priorities for action
- Continuing to emphasize voluntary action by landowners and landusers
- Supporting research that helps landowners and landusers minimize the impact of their activities on water quality

## NRCS' Commitment to Water Quality

- Training employees to make sure they are equipped to identify and help landowners and landusers solve water quality problems
- Providing financial and other incentives to farmers and ranchers for practicing good stewardship

